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10/774,215	02/06/2004	Takco Eguchi	09792909-5804	8170

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EXAMINER

FEIGINS, KRISTAL J

ART UNIT	PAPER NUMBER
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2861

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/774,215

Applicant(s)

EGUCHI ET AL.

Examiner

K. Feggins

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/7/2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3-10 and 12 is/are allowed.
- 6) ☒ Claim(s) 1,2 and 11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eguchi et al. (6,916,077 B2) in view of Shioya et al. (US 6260939 B1).

Eguchi et al. disclose the following claimed limitations:

* Re claims 1 & 2, a liquid discharge apparatus for forming pixels composed of a predetermined number of dots disposed in pixel areas on a recording medium according to a liquid discharge signal (Abstract, figs 8A-8C, 9, 14 & 16);

* a head/11/ including a plurality of liquid dischargers/ink ejecting portions/ / having nozzles/18/ aligned in a predetermined direction (figs 8A-8C, 9, 14 & 16);

* a deflecting unit/ejection deflection/ for deflecting the trajectory of a droplet discharged from one of the liquid dischargers in a predetermined direction and commanding at least two of the liquid dischargers in the vicinity to discharge droplets onto the same pixel area (col 6, lines 45-51, figs 8A-8C, 9, 14 & 16);

* a controlling unit/control circuit, fig 5/ for controlling the liquid discharge signals sent to the liquid dischargers and the deflecting unit (col 9, col 10, line 1-42, col 16, line 35-col 22, line 6, figs 5, 8A-8C, 9, 11, 14, 16 & 17).

Art Unit: 2861

* further Re claim 2, a deflecting unit capable of deflecting the trajectory of a droplet discharged from the liquid discharger with various amplitudes along a predetermined direction and for discharging droplets from at least two of the liquid dischargers in the vicinity onto the same pixel area (col 17, line 45-col 18, line 67, col 19-col 24, line 28, figs 5, 8A-8C, 9, 11, 14, 16 & 17).

* an alternative discharge unit/control circuit/ for discharging droplets alternatively, wherein the alternative discharge unit transfers at least a part of a liquid discharge signal directed to the shut-off discharger/defected/ to at least one of the other liquid dischargers and controls the discharge of droplets from at least one of the other liquid dischargers that the transferred received liquid discharge signal (col 27, lines 36-52, figs 36, col 7, lines 11-64, figs 8A-8C, 9, 14 & 16);

* regarding claim 11, a method for discharging liquid through a head including a plurality of liquid dischargers having nozzles aligned in a predetermined direction (Abstract, fig 8A-8C, 9, 14 & 16);

* forming a pixel composed of a predetermine number of dots by discharging a predetermine number of droplets from the liquid dischargers during the relative movement (col 27, lines 32-52, figs 8A-8C, 9, 14 & 16);

* transferring at least a part of a liquid discharge signal directed to the shut-off discharger/defected/ to at least one of the other liquid dischargers according to the information (col 27, lines 36-52, figs 36, col 7, lines 11-64, figs 8A-8C, 9, 14 & 16);

* controlling the discharge of droplets from at least one of the other liquid dischargers by deflecting a trajectory of a droplet discharge from the liquid discharger to which the liquid discharge signal was transferred (col 6, lines 45-51, figs 8A-8C, 9, 14 & 16);

* wherein, the head is capable of deflecting the trajectory of the droplet discharged from the liquid discharger with various amplitudes along a predetermined direction and discharging droplets from at least two of the liquid dischargers in the vicinity onto the same pixel area (col 6, lines 45-51, col 17, line 45-col 18, line 67, col 19-col 24, line 28, figs 5, 8A-8C, 9, 11, 14, 16 & 17).

Eguchi et al. does not disclose the following claimed limitations:

* Re claim 1, a storing unit for storing information on a discharge failure of the liquid dischargers;

* a controlling unit for controlling the liquid discharge signals sent to the liquid dischargers and the deflecting unit according to the information stored in the storing unit.

* Re claim 2, a storing unit for storing information on discharge failure, wherein the storing unit stores information on a liquid discharger shut-off due to discharge failure;

* wherein the alternative discharge unit transfers at least a part of a liquid discharge signal directed to the shut-off discharger to at least one of the other liquid dischargers according to the information stored in the storing unit

* Re claim 11, the method comprising the steps of relatively moving a recording medium and the head in a direction substantially perpendicular to a predetermined direction;

* storing information on a shut-off discharger due to droplet discharge failure among the plurality of liquid dischargers;

* storing information in the storing unit.

Shioya et al. disclose the following claimed limitations:

* Re claim 1, a storing unit for storing information on a discharge failure of the liquid dischargers (fig 17, col 13, lines 44-54) for the purpose of selecting nozzles to be actuated in accordance with the failed nozzle data;

* a controlling unit/203/ for controlling the liquid discharge signals sent to the liquid dischargers and the deflecting unit according to the information stored in the storing unit (fig 17, col 13, lines 44-54) for the purpose of selecting nozzles to be actuated in accordance with the failed nozzle data;

* Re claim 2, a storing unit for storing information on discharge failure, wherein the storing unit stores information on a liquid discharger shut-off/failed/ due to discharge

Art Unit: 2861

failure (fig 17, col 13, lines 44-54) for the purpose of selecting nozzles to be actuated in accordance with the failed nozzle data;

* wherein the alternative discharge unit transfers at least a part of a liquid discharge signal directed to the shut-off/failed/ discharger to at least one of the other liquid dischargers according to the information stored in the storing unit(fig 17, col 13, lines 44-54) for the purpose of storing data concerning failed nozzles.

* Re claim 11, the method comprising the steps of relatively moving a recording medium and the head in a direction substantially perpendicular to the predetermined direction (Abstract, figs 1-2) for the purpose of discharging droplets;

* storing information on a shut-off discharger due to droplet discharge failure among the plurality of liquid dischargers (fig 17, col 13, lines 44-54) for the purpose of selecting nozzles to be actuated in accordance with the failed nozzle data.

* storing information in the storing unit (fig 17, col 13, lines 44-54) for the purpose of storing data concerning failed nozzles.

It would have been obvious at the time of the invention was made to a person having ordinary skill in the art to utilize a storing unit for storing information on a discharge failure of the liquid dischargers; a controlling unit for controlling the liquid discharge signals sent to the liquid dischargers and the deflecting unit according to the information stored in the storing unit; wherein the storing unit stores information on a liquid discharger shut-off due to discharge failure; wherein the alternative discharge unit transfers at least a part of a liquid discharge signal directed to the shut-off discharger to

Art Unit: 2861

at least one of the other liquid dischargers according to the information stored in the storing unit; steps of relatively moving a recording medium and the head in a direction substantially perpendicular to the predetermined direction; storing information on a shut-off discharger due to droplet discharge failure among the plurality of liquid dischargers; and storing information in the storing unit, taught by Shioya et al. into Eguchi et al. for the purposes of discharging droplets; selecting nozzles to be actuated in accordance with the failed nozzle data; and selecting nozzles to be actuated in accordance with the failed nozzle data.

Response to Arguments

3. Applicant's arguments with respect to claim 1, 2, & 11 have been considered but are moot in view of the new ground(s) of rejection. Please see the above rejection Lee et al. in view Eguchi et al. in view of Shioya et al.. They disclose utilizing neighboring nozzles to print data when a detection of a failed nozzle has occurred and commanding at least two of the liquid dischargers in the vicinity to discharge droplets onto the same pixel area.

Allowable Subject Matter

4. Claims 3-10, 12 are allowed.

The following is an examiner's statement of reasons for allowance: The primary reason for allowance of claims 3-10 is the inclusion of the limitations of a liquid discharge apparatus that includes a discharge deflecting unit capable of deflecting the trajectory of a droplet discharged from the liquid discharger with various amplitudes along the predetermined direction, the deflecting unit discharging droplets from at least

Art Unit: 2861

two of the liquid dischargers in the vicinity onto the same pixel area, and discharging droplets from a liquid discharger selected from among the liquid dischargers capable of discharging droplets onto a pixel area for a pixel composed of a predetermined number of dots. It is this limitation found in the claims, as it is claimed in the combination of that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

The primary reason for allowance of claim 12 is the inclusion of the method steps for discharging liquid that includes transferring at least a part of a liquid discharge signal directed to the shut-off discharger to a free time slot, where not discharger of droplets is commanded, for at least one of the other liquid dischargers according to the information stored in the storing unit. It is this step found in the claims, as it is claimed in the combination of that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Couwenhoven et al. (US 6354689 b1) disclose a method of compensating for malperforming nozzles in a multitone inkjet printer. Koitabashi et al. (US 6908176 B2) disclose a recording apparatus for forming a color image where supplementing units for effecting supplementations in different manners, for supplementing defects in a recorded image resulting from a non-operating recording element of the recording elements and controls units for operating the plurality of supplementing units depending on a record image. Hermanson (US 5581284) disclose a method of extending the life of a printbar of a color ink jet printer by checking each

Art Unit: 2861

nozzle in the printbar for drop ejection, identifying any nozzle which fails to eject a droplet and substituting at least one droplet from a nozzle to another printbar.

Communication With The USPTO

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to K. Feggins whose telephone number is 571-272-2254. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on 571-272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

kf


K. FEGGINS
PRIMARY EXAMINER